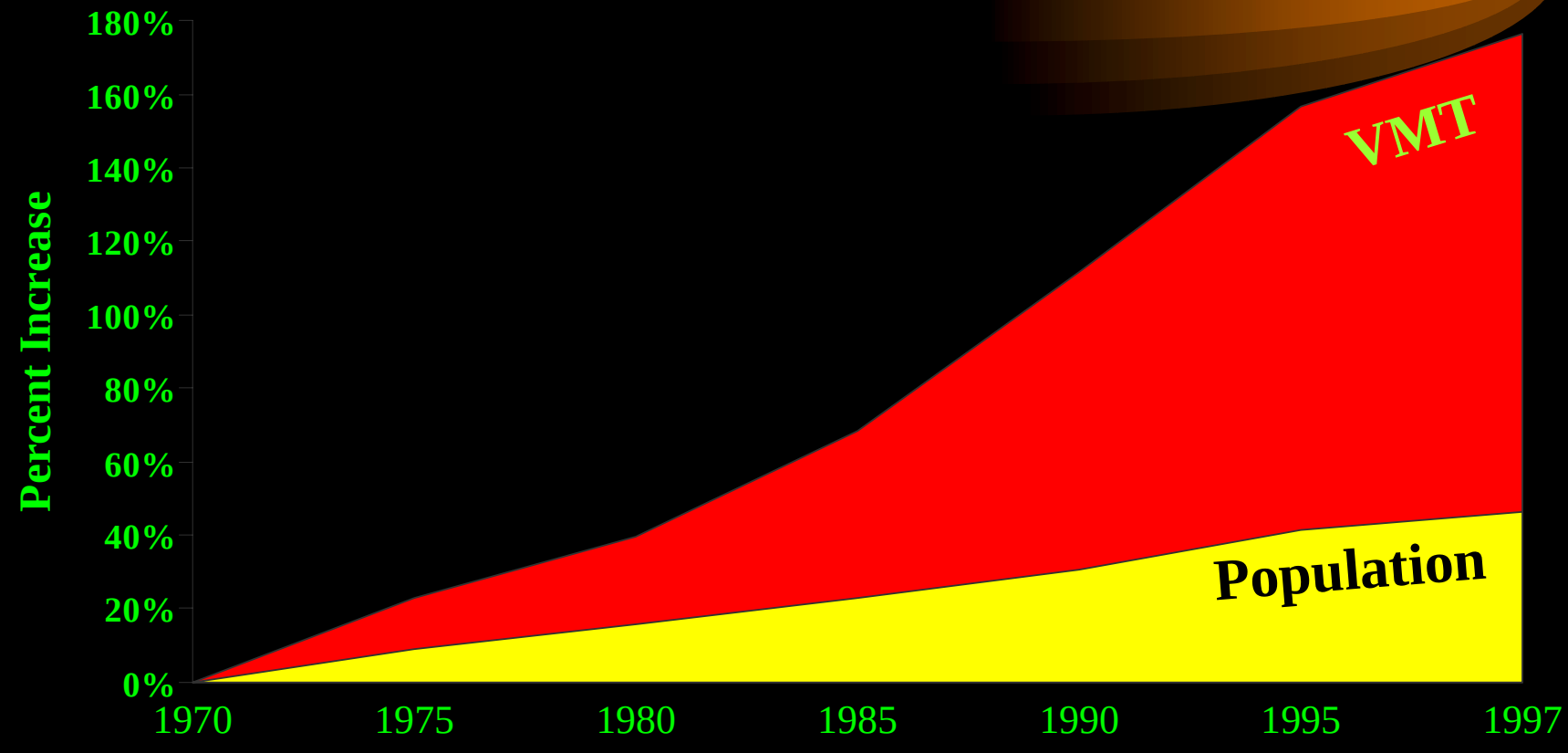
Four-Lane Divided vs Five-Lane Section

NCDOT

NORTH CAROLINA
Population & VMT Growth



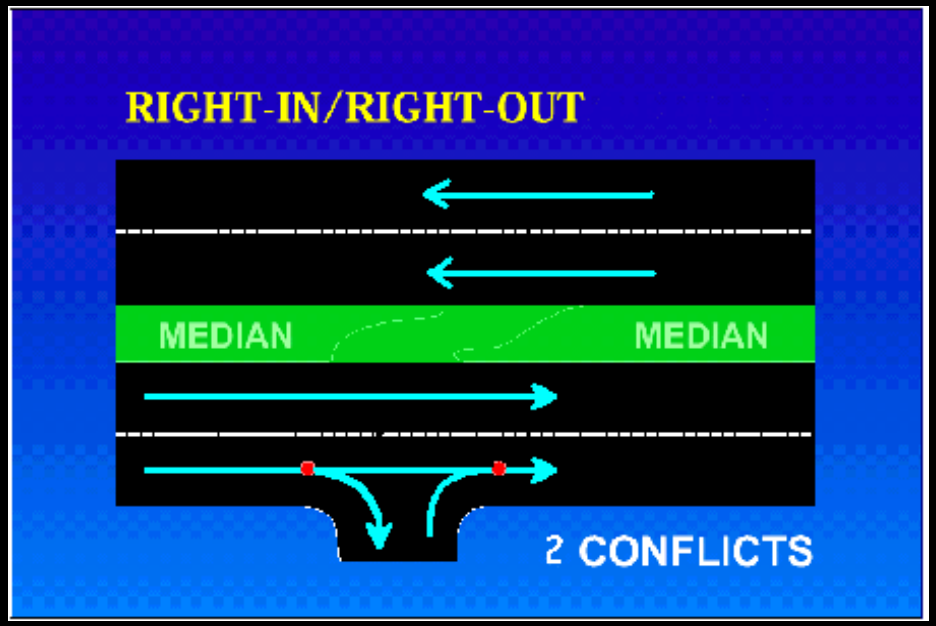
VMT => Vehicle Miles Traveled

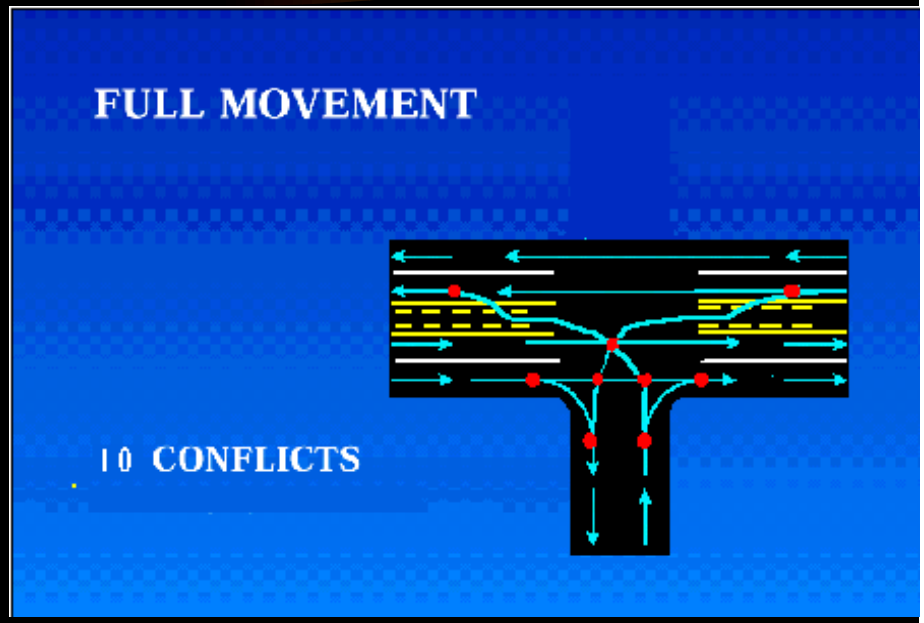
Key Issues of Comparison

- Safety
- Congestion
- Environment
- Economics

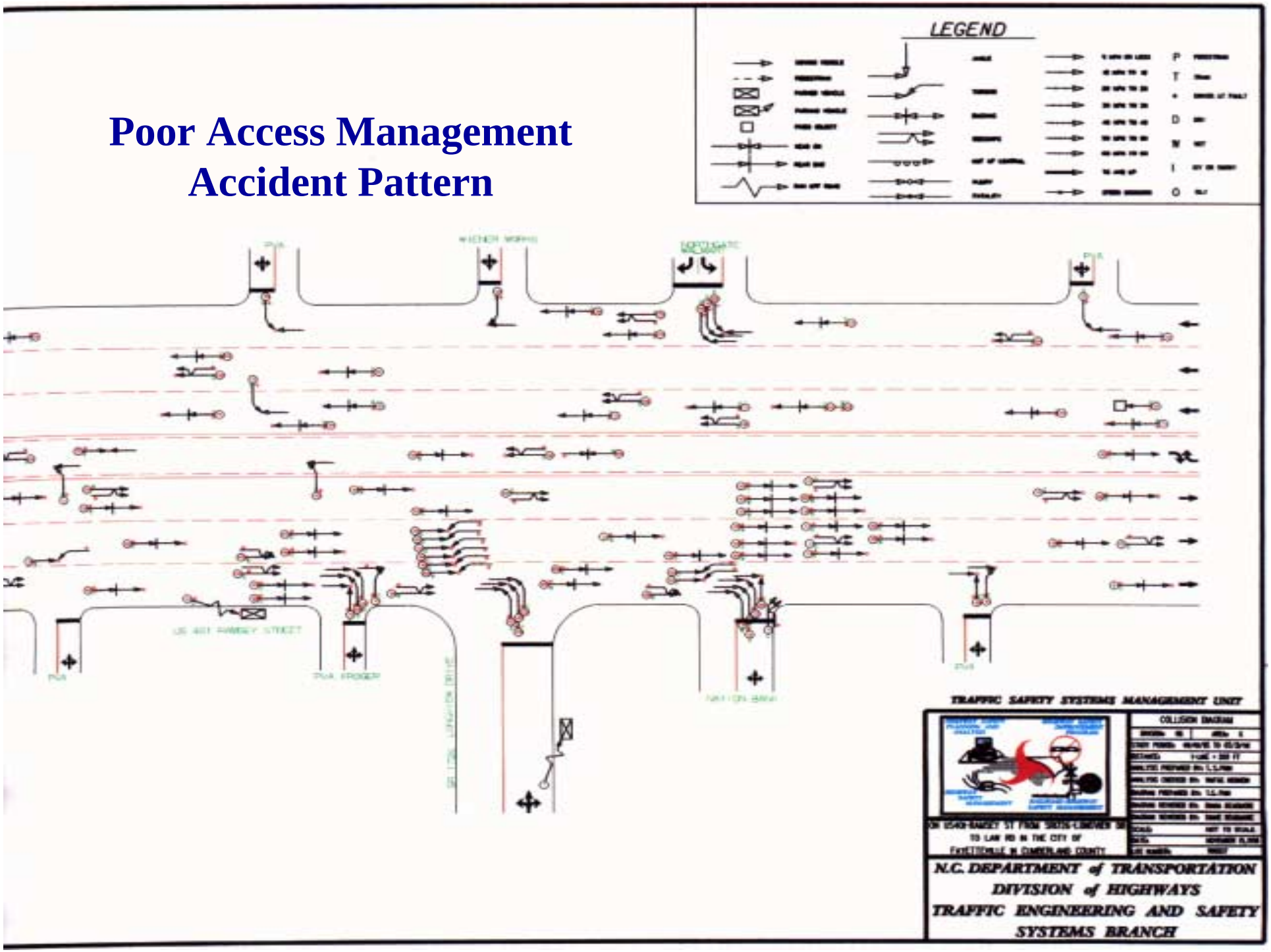
Access and Safety

As Access Increases So Do Conflicts and Accident Potential

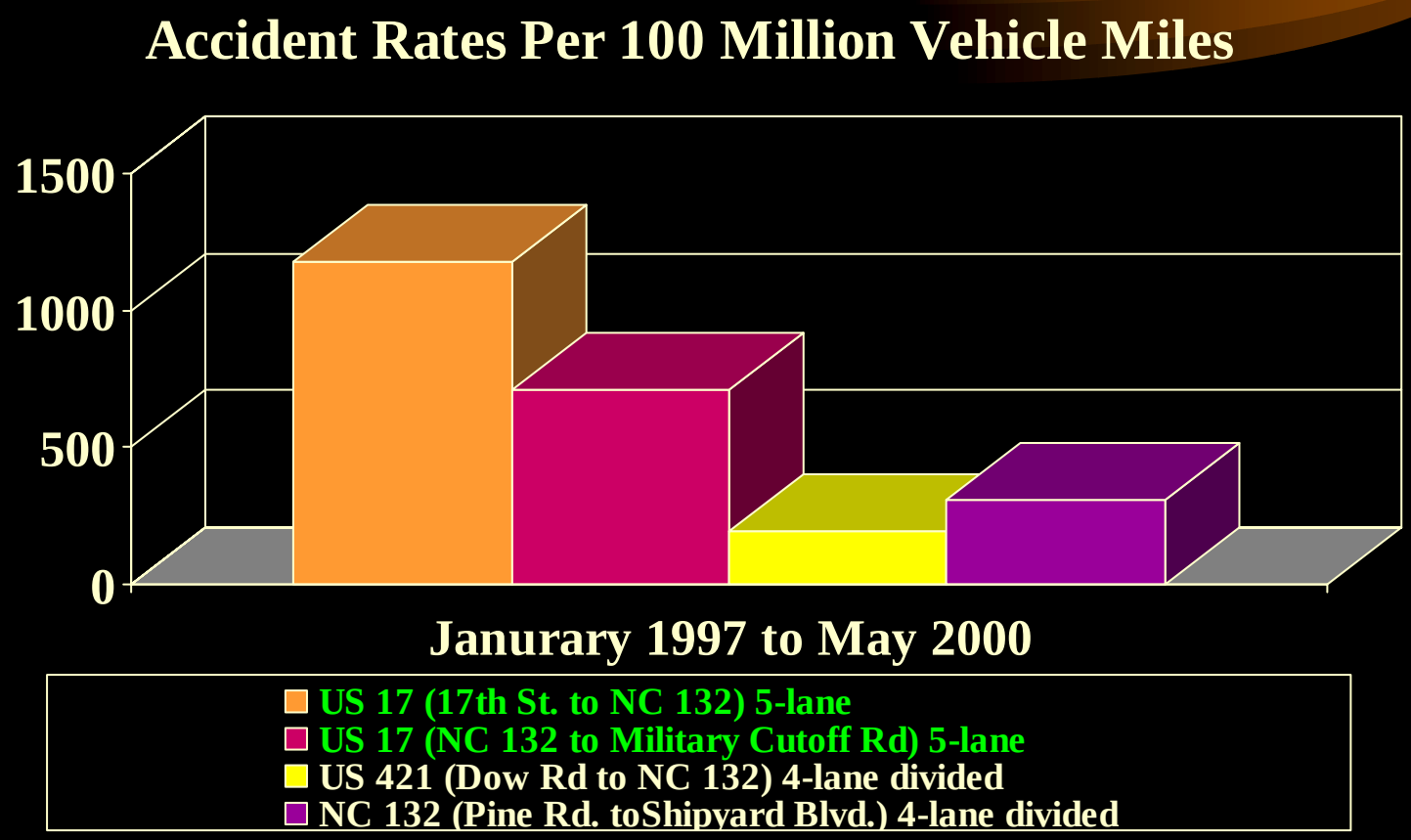




Poor Access Management Accident Pattern

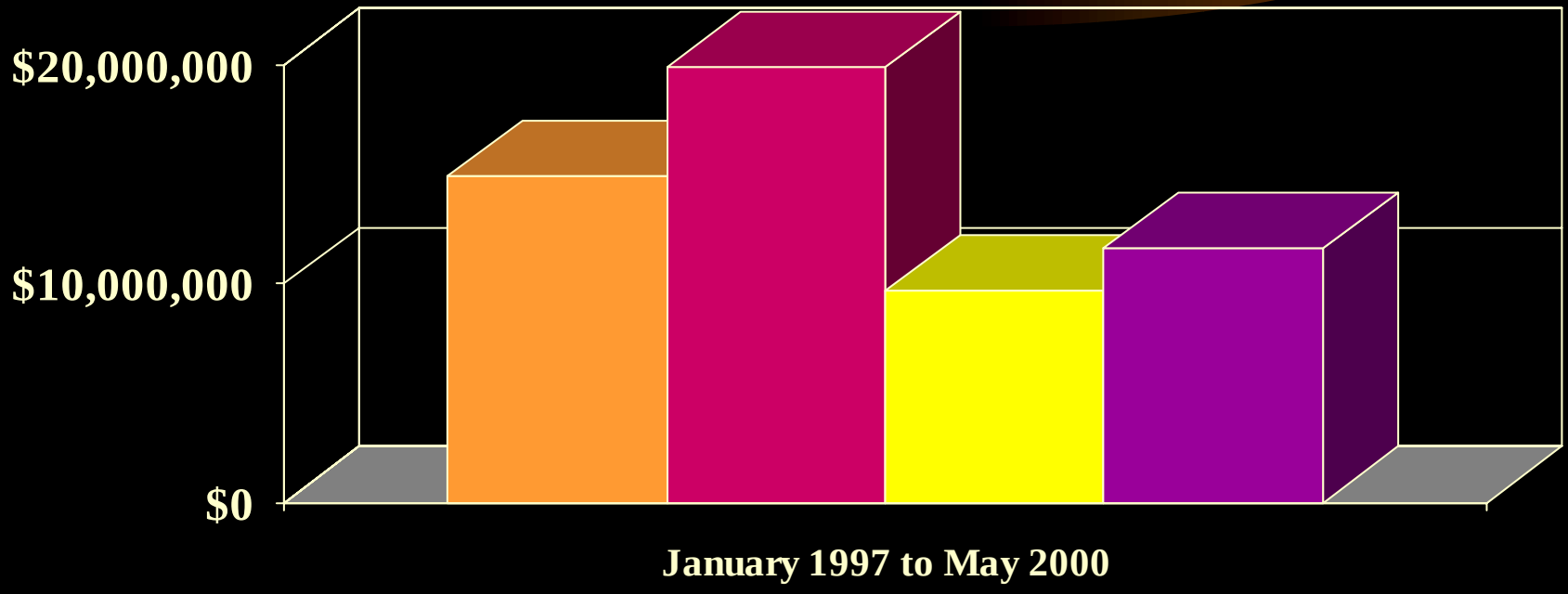


Case Study
Wilmington, NC



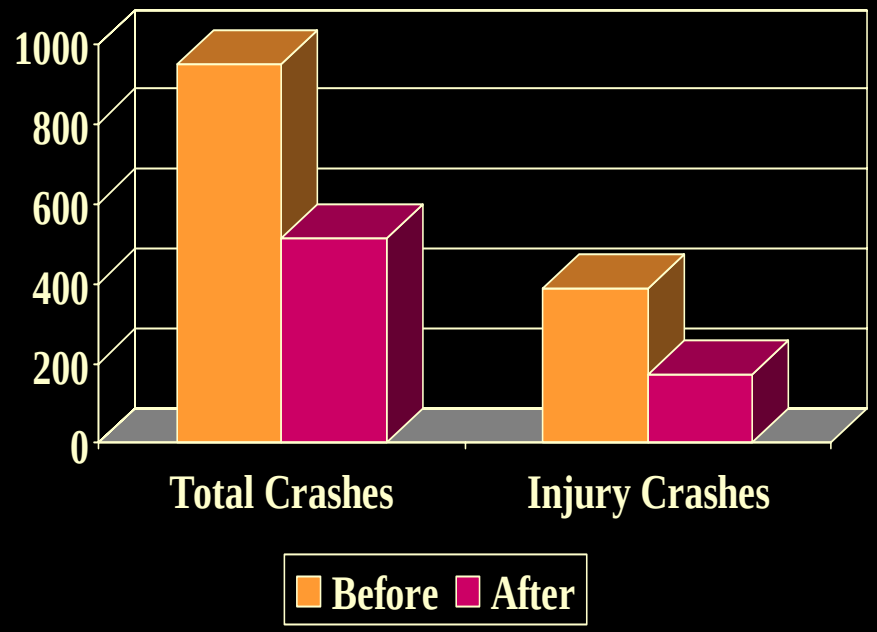
Case Study
Wilmington, NC

Comprehensive Accident Costs Per 100 Million Vehicle Miles
(Based on 1998 Dollars)

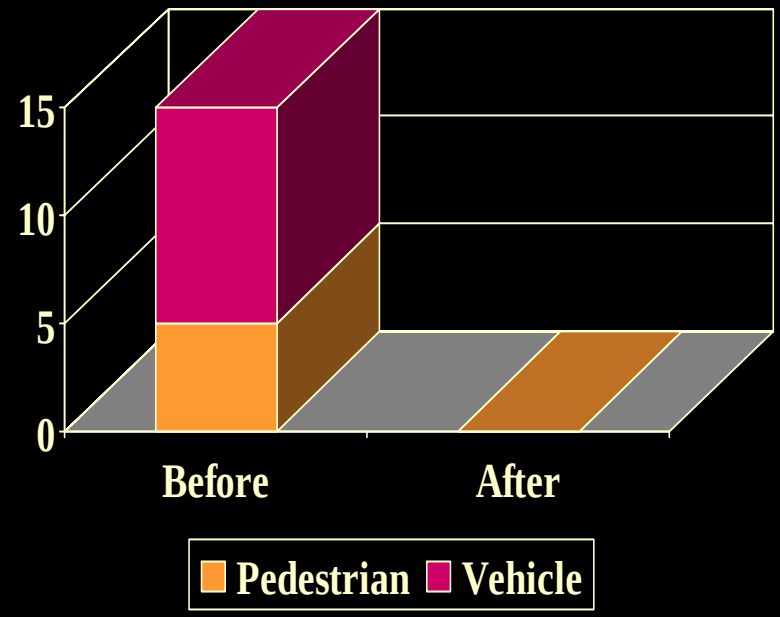


Case Study
Memorial Drive, Atlanta

Crash Comparison
(Per 100-million vehicle miles)



Fatality Comparison



Source: P.D. Parsonson, "Medians Versus Two-Way Left-Turn Lanes, The Georgia Experience", 1996

North Carolina Data

Safety Comparison of Multi-Lane Facilities Carrying Approximately 30,000 Vehicles per Day

Five Lane Facility (a 2.38 mile section of US 64 in Asheboro)

Four Lane Divided Facilities (a 3.3 mile section of US 29 in Cabarrus County and a 3.69 mile section of US 74 in Cleveland County)

Facility Section Sampled	Cross Section	Section Limits	Length (Miles)	ADT (weighted)	Study Period	Number of Crashes Reported	Total Crash Rate (Crashes/100 MVMT)	Statewide US Route Crash Rates (Urban + Rural) (Crashes/100 MVMT)	Injuries
US 64 (Dixie Dr.) in Asheboro, Randolph County	Five (5) Lane with TWLTL	From NC 42 to Just East of US 220	2.38 miles	29,800	3 Years (4/1/98 – 3/31/01)	391 (avg. 55 crashes per year per mile)	503	198.64 urban 266.88 rural 156.73	248
US 29, In Concord, Cabarrus County	Four (4) Lane Divided	From SR 1414 to SR 1305	3.3 miles	28,000	3 Years (4/1/98 – 3/31/01)	132 (avg. 13.3 crashes per mile per year)	130	198.64 urban 266.88 rural 156.73	90
US 74 (Dixon) in in Shelby, Cleveland County	Four (4) Lane Divided	From SR 2245 to NC 180	3.69 miles	30,300	3 Years (4/1/98 – 3/31/01)	252 (avg. 22.8 crashes per mile per year)	206	198.64 urban 266.88 rural 156.73	209

US 64 Bullets

- 48% of Reported Crashes were Rear-End Stop/Slow
- 20 % of Reported Crashes were Angle Type
- 8% Left turn same road
- 8% Left turn different road

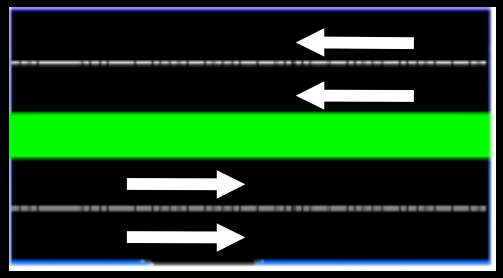
US 29 Bullets

- 46% of Reported Crashes were Rear End Stop/Slow
- 13% of Reported Crashes were Angle Type

Safety Summary

Two-Way-Left-Turn-Lanes

- High Crash Rates but better than undivided facility
- More Dangerous for Pedestrians



Non-traversable Medians

- Lowest Crash Rates
- Safest for Pedestrians

Source: Transportation Research Group, Oregon State University, "Medians a Survey of the Literature", 1997

Safety Summary (Con.)

- Research suggest that when traffic volumes exceed 24,000 vehicles per day that a two-way-left-turn-lane should be replaced
- Associate Director of University of NC Highway Safety Research Center does not recommend five lane facility for pedestrian crossing
- NCDOT is sponsoring research project with NCSU and ITRE on safety comparisons of four-lane divided and U-turns with five-lane section

Source: Transportation Research Group, Oregon State University, "Medians a Survey of the Literature", 1997

Five-Lane Pedestrian Crossing, Cary, NC

Access and Congestion

Medians Result in Improved Traffic Operations

- Reduction of traffic congestion
  - Increased roadway capacity
  - Improved travel speed
  - Reduced delay
  - Improved fuel efficiency
  - Less stop and go traffic

Medians and Environment

- Medians allow a refuge area for pedestrians
- Reduce emissions
- Reduce headlight glare from opposing traffic
- Median sections require less pavement than 5-lane sections
    - Results in less runoff on the facility
    - Medians allow more room for landscaping
    - Medians provide more attractive corridors

Economics

ECONOMIC IMPACT MODEL

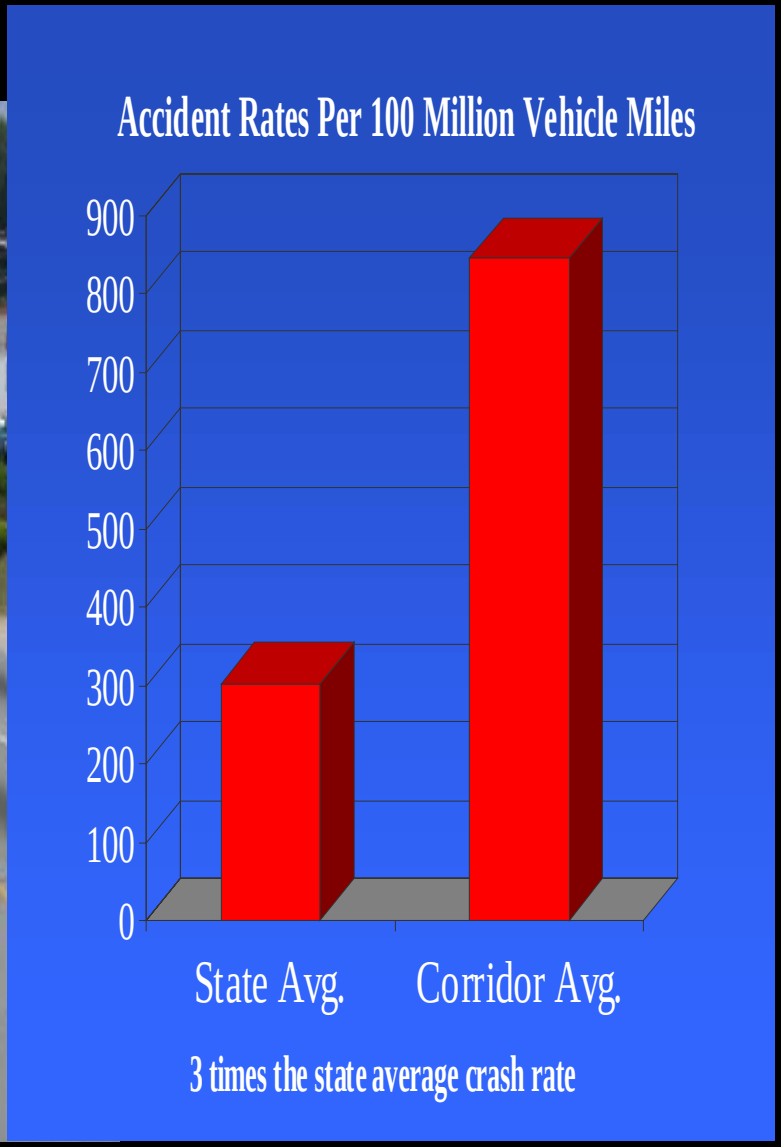
Land Use	(A) % Pass-by Traffic	(B) Estimated Left Turns As % of Total Entering Traffic	
1 Gasoline Service Station	55	**ADT**	**%**
Convenience Market		5,000	43
Small Retail < 50,000 sq. ft.		10,000	40
		20,000	30
2 Fast Food Restaurant with Drive Through Window	45	30,000 or more	15
Supermarkets			
Shopping Center			
50,000 - 100,000 sq. ft.			
3 High Turnover sit-down restaurant	40		
4 Shopping Centers	30		
250,000 - 500,000 sq. ft.			
5 Shopping Centers	20		
Over 500,000 sq. ft.			

Source: Impacts of Access Management Techniques, "The Economic Impacts of Medians: An Empirical Approach"

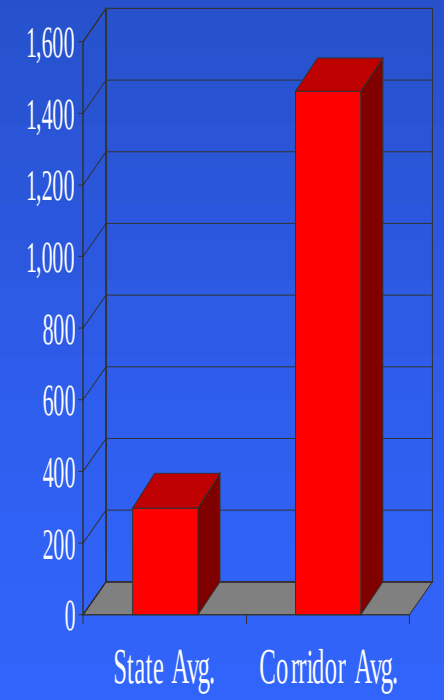
Summary of Benefits

- Improved motorist and pedestrian safety
- Preserves the publics investment in the transportation infrastructure
- Reduction of traffic congestion
  - Increased roadway capacity
  - Improved travel speeds
- Preservation of community character

US 264A, Greenville



Market Street, Wilmington



Nearly 5 times the State Average Rate

Our Goal

To balance the need to provide safe, efficient, and timely travel throughout the state with the ability to allow access to the individual destination.

NCDOT

Four-Lane Divide / Five-lane Research Project Criteria

- ≥ ¼ mile long,
- 35-45 mph speed limit,
- ≥ 20,000 ADT, and
- No widening or major changes within last three years.

Alternate Means of Access